



Indian and Northern
Affairs Canada

Affaires indiennes
et du Nord Canada

CAI
IA
-Z030

Government
Publications

GUIDE FOR EXPEDITIONS TO NORTHERN AND ARCTIC CANADA



3 1761 11765099 4

Canada

GUIDE FOR EXPEDITIONS
TO NORTHERN AND
ARCTIC CANADA



Arctic Expeditions Secretariat
Circumpolar & Scientific
Affairs Directorate
Department of Indian Affairs
and Northern Development
OTTAWA, Canada
K1A 0H4

Published under the authority of the
Hon. Tom Siddon, P.C., M.P.,
Minister of Indian Affairs and
Northern Development,
Ottawa, 1992..

QS-8268-000-EE-A4

Catalogue No. R72-226/1992E

ISBN 0-662-19978-X

Minister of Supply and Services Canada

Cette publication peut aussi être obtenue
en français sous le titre:

Guide des expéditions dans
le nord et dans l'arctique canadiens



TABLE OF CONTENTS

INTRODUCTION	vii
--------------	-----

EXPEDITIONS REGISTRATION FORM	ix
-------------------------------	----

EXPEDITIONS COMPLETION FORM	xiii
-----------------------------	------

PART I


First Steps	1
Wilderness Travel	
Registration System	2
Royal Canadian	
Mounted Police	3
Firearms	4
Bears and Other Wildlife	6
Insects	7
Geographical Names	8
Topography	9
Climate	9
Sea Ice	10
Medical Services	10
Accommodation in Small	
Communities	11
Research and Commercial	
Activity in the Inuvialuit	
Settlement Region	12
Search and Rescue	13

ENTRY TO CANADA	14
-----------------	----

Customs and Immigration	
Requirements	14
Immigration	14
Customs and Excise	14
Communications and	
Transportation Requirements	15
Radio Act and General Radio	
Regulations	15
Transportation	16
Marine	16
Air	17

FACILITIES IN THE ARCTIC	18
Restricted Sites and Facilities	18
North Warning System (NWS), Distant Early Warning (DEW), and Department of National Defence (DND)	18
High Arctic Weather Stations (HAWS)	20
Polar Continental Shelf Project	21
Necessary Provisions Required for Your Expedition	21
Food	21
Caches	22
National Parks	23
Territorial Land Use Regulations	24
Arctic Waters Pollution Prevention Act	25
WILDLIFE AND FISH	26
Northwest Territories Wildlife Act	26
Migratory Birds Convention Act/Canada Wildlife Act	27
Game Export Act	28
CITES Export and Import Permits	29
Fisheries Act and Regulations	29
Archaeological and Historical Resources	32
Scientific Research Activities	32
PART II	
A PHYSIOLOGICAL DESCRIPTION OF THE NORTH AND ARCTIC REGIONS OF CANADA	34
Climate	34
Ecological Sites	35
Permafrost	37
Plant Life	37
Land Mammals	38
Marine Mammals	38
Fish	39
Birds	39

SEAS AND SEA ICE	40
Ice Features - Pressure Ridges	40
Ice Features - Leads and Polynyas	41
Ice Features - Icebergs and Ice Islands	41
Ice Features - Pack Ice	42
PEOPLE AND TEMPERATURES	42
Frost-bite	45
Hypothermia	46
Snow Blindness	46
Carbon Monoxide Poisoning	47
Litter	47
CONCLUSION	48



Digitized by the Internet Archive
in 2022 with funding from
University of Toronto

INTRODUCTION

This booklet was published under the direction of the Arctic Expeditions Committee as an aid to those preparing for a journey or expedition to Canada's North and Arctic regions. The "North" is usually considered to be that region which extends northward from the southern limit of the discontinuous permafrost line; this includes all the Yukon Territory and the Northwest Territories. The term usually includes the northern region of Canada's provinces, however, the application here is limited to Canada's two territories: the Yukon Territory and the Northwest Territories.

This guide contains useful contact addresses and basic information about the region. It also provides specific guidelines about the rules, regulations and precautions necessary for an expedition or self-guided wilderness trip into remote regions of Canada. The guide is intended to provide guidelines regarding the applicable rules and regulations, but it does not constitute legal advice, and should not be relied upon as an exhaustive description of applicable rules and regulations.

Visitors to the North and Arctic are strongly encouraged to take every precaution to ensure that neither the fragile ecosystems nor northern residents are disturbed in any way.

Registration forms are included in this Guide to ensure that your goals are known to all relevant communities and organizations in Canada. The forms are to be completed and returned to the Arctic Expeditions Secretariat, one at the beginning and the other at the end of your trip. This exercise will

help you enjoy a safe and successful journey in northern and Arctic Canada. All correspondence regarding this booklet and any other questions should be sent to:

Arctic Expeditions Secretariat
Circumpolar &
Scientific Affairs Directorate
Department of Indian Affairs
and Northern Development
OTTAWA, Ontario
K1A 0H4
Canada

Telex: 053-3711
FAX: (819) 953-0546

The completion of this form will help expedite preparations for a successful expedition and ensure its publication in the **Arctic Expeditions Index**. Please send the completed form to the Arctic Expeditions Secretariat.

EXPEDITIONS REGISTRATION FORM

Planned date of arrival in Canada

Planned length of stay

Planned points of entry to and exit from Canada

Mode(s) of transportation from your country or region to northern and/or Arctic Canada

Purpose(s) of expedition/travel

Proposed itinerary/route into and through Canada's North and Arctic

Mode(s) of transportation during expedition

List of supplies and equipment with serial numbers where applicable (use attachment if required)

What is the estimated cost of your expedition?

How is your expedition being funded? Please give details.

Name(s), sex, nationality(ies), birth date(s) of expedition participants

Do members of your expedition carry adequate insurance to cover emergency situations?

Yes

☐

No

☐

Short biographical profile of each participant, including address(es) and telephone number(s).

Please place a check mark beside the government departments and agencies contacted prior to your journey to northern Canada.

- | | |
|--------------------------|--|
| <input type="checkbox"/> | Secretariat, Arctic Expeditions Committee, Department of Indian Affairs and Northern Development |
| <input type="checkbox"/> | Department of Economic Development and Tourism, Government of the Northwest Territories |
| <input type="checkbox"/> | Department of Tourism, Government of Yukon |
| <input type="checkbox"/> | The Royal Canadian Mounted Police (RCMP) |
| <input type="checkbox"/> | Department of Renewable Resources, Fish and Wildlife Branch, Government of Yukon |
| <input type="checkbox"/> | Department of Renewable Resources, Government of the Northwest Territories |
| <input type="checkbox"/> | Agriculture Canada |
| <input type="checkbox"/> | Canadian Permanent Committee on Geographical Names, Energy, Mines and Resources Canada |
| <input type="checkbox"/> | Arctic Meteorology Section, Environment Canada |
| <input type="checkbox"/> | Ice Centre, Environment Canada |
| <input type="checkbox"/> | Medical Services, N.W.T. Region, Health and Welfare Canada |
| <input type="checkbox"/> | Port Administration Division (Customs), Canada Customs and Excise |
| <input type="checkbox"/> | Frequency Management and Licensing Division, Department of Communications |
| <input type="checkbox"/> | Coast Guard Northern, Transport Canada |
| <input type="checkbox"/> | Canada Map Office, Energy, Mines and Resources Canada |

- ☐ Airports Division, Department of Local Government, Government of the Northwest Territories
- ☐ Department of National Defence
 - North Warning System
 - Continental Policy
 - Northern Region Headquarters
- ☐ Atmospheric Environment Service, Environment Canada
- ☐ Polar Continental Shelf Project, Energy, Mines and Resources Canada
- ☐ Traveller's Directorate, Operations and Policy Division, Revenue Canada, Canada Customs
- ☐ Canadian Parks Service, Eastern Arctic District
- ☐ Canadian Parks Service, Western Arctic and Yukon District
- ☐ Land Resources, Department of Indian Affairs and Northern Development
- ☐ Northern Environment, Department of Indian Affairs and Northern Development
- ☐ Habitat Biologist, Canadian Wildlife Service, Environment Canada
- ☐ Convention on International Trade in Endangered Species, Canadian Wildlife Service
- ☐ Field Services, Department of Fisheries and Oceans
- ☐ Prince of Wales Northern Heritage Centre, Government of the Northwest Territories
- ☐ Science Institute of the Northwest Territories

Please return this completed form to the Secretariat following your expedition. It will help the Arctic Expeditions Secretariat to inform other Canadian agencies of your experiences and determine areas in which service to northern and Arctic travellers can be improved.

EXPEDITIONS COMPLETION FORM

Name

Date of arrival in Canada

Date of departure from Canada

Locations visited

Did your itinerary differ from your initial plans, how and why?

Did you face any (unexpected) physical danger? Please describe.

What was the most outstanding experience of your visit?

What changes would you make to your plans if you had to do your trip over again?

Was information provided by government agencies adequate or would additional information have improved your experience? Please explain.

Please add any other comments, if you wish, regarding your experiences in northern Canada.

[illegible]

PART 1

First Steps

We welcome your interest in Canada's northern and Arctic region, and wish you every success with your travel plans.

Canadian government departments and agencies will be pleased to offer all possible assistance in the planning of your expedition. Please contact all or any of the addresses given here in preparation for your expedition in Canada. Your first contact should be made in writing to:

Arctic Expeditions Secretariat
Circumpolar and Scientific
Affairs Directorate
Department of Indian Affairs
and Northern Development
OTTAWA, Ontario
K1A 0H4
Canada

The Arctic Expeditions Secretariat will ensure that other pertinent government departments and agencies are informed of your plans. This will allow for corrective action prior to your arrival in Canada.

If you are travelling to the Canadian North and Arctic, you are encouraged to write to the appropriate territorial government for additional information. The addresses are:

For the Northwest Territories:

Department of Economic
Development and Tourism
Government of the
Northwest Territories
YELLOWKNIFE, N.W.T.
X1A 2L9
Canada

Telephone: 1-800-661-0788

For the Yukon Territory:

Department of Tourism
Government of the Yukon
Box 2703
WHITEHORSE, Yukon
Y1A 2C6
Canada

Telephone: (403) 667-5340

FAX: (403) 667-2634

Wilderness Travel Registration System

A wilderness travel registration system is operated by the Royal Canadian Mounted Police (RCMP) in cooperation with the governments of the territories (Northwest and Yukon). All persons travelling in the North and Arctic are expected to register with the RCMP. Registration forms are available from any RCMP detachment.

The Department of Economic Development and Tourism should also be notified of your planned itinerary; the department will inform you of any necessary requirements. For instance, certain areas of the territories may only be visited by non-residents who are accompanied by a licensed outfitter.

Royal Canadian Mounted Police

Detachments of the Royal Canadian Mounted Police (RCMP) are located at: Arctic Bay, Broughton Island, Cambridge Bay, Cape Dorset, Clyde River, Coppermine, Gjoa Haven, Grise Fiord, Hall Beach, Holman, Igloolik, Inuvik, Iqaluit, Lake Harbour, Nanisivik, Pangnirtung, Pelly Bay, Pond Inlet, Resolute, Sachs Harbour, Taloyoak and Tuktoyaktuk, in the Northwest Territories. The RCMP can offer assistance and act as contact points for you.

Each detachment is equipped with single side-band radios and/or telephones with access to major centres such as Iqaluit, Inuvik and Yellowknife. However, expeditions should be forewarned that the RCMP is not in a position to offer radio-monitoring services.

For further information contact:

Officer In Charge
"G" Division Criminal Operations
Royal Canadian Mounted Police
(RCMP)
Bag 5000
YELLOWKNIFE, N.W.T.
X1A 2R3
Canada

Telephone: (403) 920-8333
FAX: (403) 873-6235

Firearms

A Firearms Acquisition Certificate is required to acquire a rifle in Canada. The certificate is available from any detachment of the Royal Canadian Mounted Police (see above for locations). A special permit is required to carry restricted weapons such as pistols and revolvers. These too are available from any detachment of the Royal Canadian Mounted Police.

Expeditions may carry rifles or shotguns for protection from wild animals provided they are certified. In national parks or national parks reserves the following rules apply. Section 20 of the *National Parks Wildlife Regulation* states that "no person shall be in possession of a firearm unless the firearm is not loaded and: (a) if the firearm is a kind of model capable of being dismantled by taking apart and separating the barrel and stock, it is carried in the dismantled condition; or (b) if the firearm is not of a kind or model described in paragraph (a) it is carried in a closed case or wrapped and tied securely in such a manner as not to expose any part of the firearm".

In the event that an animal must be killed in self-defence, the kill must be reported immediately to the Chief Park Warden or to an officer of the RCMP. If an animal is killed outside a national park, the Resource Officer of the Department of Renewable Resources closest to the incident must be notified.

In areas outside of parks, it is strongly recommended that expeditions acquire polar bear deterrents as the first means of discouraging aggressive bears. Two well-known deterrents are: a 12-gauge plastic "ferret" slug used in certain shotguns. This is available under the trade name "Best Ecological Alternative Round-Bear Deterrent Cartridge". Another polar bear deterrent is oleoresin capsicum spray repellent, sold under the trade name: "Counter Assault", available from Margo Supplies Ltd., Site 20, Box 11, RR6, Calgary, Alberta P2M 4L5.

There are regulations governing the possession and use of firearms in Migratory Bird Sanctuaries. The appropriate sections of the Migratory Bird Sanctuary Regulation (*Migratory Birds Convention Act*) are as follows:

4.(1) No person shall have in his/her possession in a migratory bird sanctuary:

(a) any firearm; or

(b) any hunting appliance except as otherwise provided in these Regulations.

4.(3) Subject to the Act and the Migratory Birds Regulations, the Minister may issue a permit authorizing any person to have firearms in his/her possession...in such portion of a Migratory Bird Sanctuary and during such time as are specified in the permit.

Canadian Wildlife Service contacts for persons who wish to visit a Migratory Bird Sanctuary, or to carry a firearm in a Migratory Bird Sanctuary are:

For the Northwest Territories:

Enforcement Coordinator
Canadian Wildlife Service
P.O. Box 637
YELLOWKNIFE, N.W.T.
X1A 2N5
Canada

Telephone: (403) 920-8551
FAX: (403) 873-8185

For the Yukon Territory:

Enforcement Coordinator
Canadian Wildlife Service
2392 Ospika Boulevard
PRINCE GEORGE, British Columbia
V2N 3N5
Canada

Telephone: (604) 561-5525
FAX: (604) 561-5534

Bears and Other Wildlife

Polar bears, grizzly bears, black bears and other wildlife such as wolves and foxes, inhabit the Northwest Territories and Yukon. Visitors on expeditions should be aware of the importance of maintaining clean camps because bears are attracted by the scent of food. Garbage should be collected and incinerated on a daily basis. Non-burnable waste must be stored in animal-proof containers and taken from the site when you leave.

For information on northern or Arctic wildlife, contact:

For the Northwest Territories:

Director
Conservation Education
P.O. Box 1320
Department of Renewable
Resources
Government of the
Northwest Territories
YELLOWKNIFE, N.W.T.
X1A 2L9
Canada

For the Yukon Territory:

Department of Renewable
Resources
Fish and Wildlife Branch
Government of the Yukon
P.O. Box 2703
WHITEHORSE, Yukon
Y1A 2C6
Canada

Telephone: (403) 667-5221
FAX: (403) 667-2691

Insects

The very considerable nuisance that biting insects can cause must be considered when planning your expedition. For information about biting insects contact:

Center for Land and
Biological Resources Research
Agriculture Canada
OTTAWA, Ontario
K1A 0C6
Canada

Telephone: (613) 996-1665

Geographical Names

Expedition and self-guided wilderness travellers should not assign unofficial names to features or places and use them in reports and articles related to their journeys. Proposed names for unnamed geographical features are considered by the Canadian Permanent Committee on Geographical Names and are subject to well-established toponymic guidelines. For more information on geographical names, send for a copy of "Principles and Procedures for Geographical Naming" and "Naming Canada's Geographical Features" from:

Secretariat
Canadian Permanent
Committee on Geographical
Names
Energy, Mines and
Resources Canada
615 Booth St.
OTTAWA, Ontario
K1A 0E9
Canada

Telephone: (613) 992-3892
FAX: (613) 943-8282

In the Northwest Territories:

Territorial Toponymist
c/o Prince of Wales Northern
Heritage Centre
Government of the
Northwest Territories
YELLOWKNIFE, N.W.T.
X1A 2L9
Canada

Telephone: (403) 920-8854

In Yukon Territory contact:

Director
Heritage Branch
Department of Tourism
Government of the Yukon
P.O. Box 2703
WHITEHORSE, Yukon
Y1A 2C6
Canada

Telephone: (403) 667-5386
FAX: (403) 667-2634

Topography

Canada has a well-established collection of maps and aerial photographs of the North and Arctic regions. The collection is being expanded and updated continually. Details are available from:

Canada Map Office
Energy, Mines and Resources
Canada
615 Booth St.
OTTAWA, Ontario
K1A 0E9
Canada

Climate

Information on climate in northern and Arctic Canada can be obtained from:

Arctic Adaptation Division
Climate Adaptation Branch
Canadian Climate Centre
Environment Canada
4905 Dufferin Street
DOWNSVIEW, Ontario
M3H 5T4
Canada

Sea Ice

Information on sea ice is available from:

Ice Centre
Environment Canada
3rd Floor , 373 Sussex Drive
Block "E"
OTTAWA, Ontario
K1A 0H3
Canada

Telephone: (613) 996-5236
FAX: (613) 563-8483

Medical Services

Medical services and supplies are not readily available in the North or the Arctic. It is recommended that all travellers undergo medical and dental examinations and carry a medical insurance policy before undertaking an expedition. Travellers are also responsible for carrying an adequate supply of required medication(s). All expeditions should carry first aid equipment and at least one member should be trained in wilderness first aid.

Further information on the location and types of medical services available in northern or Arctic Canada is available from:

Department of Health
Government of the
Northwest Territories
P.O. Box 1320
YELLOWKNIFE, N.W.T.
X1A 2L9
Canada

Telephone: (403) 920-6173

Medical Services Branch
Health and Welfare Canada
#2 Hospital Rd.
WHITEHORSE, Yukon
Y1A 3H8
Canada

Telephone: (403) 667-8300
FAX: (403) 667-4991

Accommodation in Small Communities

Small and remote communities in northern and Arctic Canada cannot always provide accommodation. Travellers should contact the communities they intend to visit well in advance of their journey. Information on community contacts and accommodation can be obtained from:

For the Northwest Territories:

Department of Economic
Development and Tourism
Government of the
Northwest Territories
YELLOWKNIFE, N.W.T.
X1A 2L9
Canada

Telephone: (403) 873-7200

For the Yukon Territory:

Department of Tourism
Government of the Yukon
P.O. Box 2703
WHITEHORSE, Yukon
Y1A 2C6
Canada

Telephone: (403) 667-5340
FAX: (403) 667-2634

Research and Commercial Activity in the Inuvialuit Settlement Region

Through the *Inuvialuit Final Agreement (IFA)*, which is a land claim settlement between the Inuvialuit of the Western Beaufort and the Government of Canada, the Inuvialuit people gained private ownership of some 91,000 square kilometres of land. A regime for screening development activity for potential negative impact on wildlife and the environment was also established.

Anyone planning research or commercial activity in the Inuvialuit Settlement Region, (which includes the Yukon North Slope), should contact both the Inuvialuit Land Administration and the Environmental Impact Screening Committee at:

Inuvialuit Land Administration
P.O. Box 290
TUKTOYAKTUK, N.W.T.
X0E 0C0
Canada

Telephone: (403) 977-2202

Environmental Impact Screening
Committee
Joint Secretariat
P.O. Box 2120
INUVIK, N.W.T.
X0E 0T0
Canada

Telephone: (403) 979-2828

Search and Rescue

The principle of law, *Volenti, non fit injuria* (that is, one who knowing and comprehending the danger, voluntarily exposes himself to it, is deemed to have assumed the risk and is precluded from recovery for an injury resulting therefrom) is indeed applicable to travel in areas of known or evident hazard. Accordingly, those planning to travel in the North and Arctic should be fully aware of the risks and hazards and of the lack of search and rescue capabilities in most areas. It is recommended that expeditions make prior arrangements with a carrier capable of providing emergency evacuation.

If search and rescue operations become necessary, despite the fact that all necessary precautions have been taken, the Royal Canadian Mounted Police detachments at Yellowknife and Iqaluit are equipped with Twin Otter aircraft used to supplement initial ground searches. The Department of National Defence maintains search and rescue units and has the primary role of responding to air and marine disasters. However, these units may be located a long way from where emergency help is needed. Expeditions must be fully aware that it may not be possible to mount a search and rescue operation in time to avert tragedy.

ENTRY TO CANADA

Customs and Immigration Requirements

Immigration

All foreign nationals must hold a valid passport (except United States citizens and permanent residents, or limited-status landed immigrants of the U.S.A.). Whether you need a visa can be determined by contacting any Canadian foreign mission.

Customs and Excise

The Customs Act (Canada) requires that every person entering Canada must report to the nearest Customs office immediately upon arrival. As well, all goods brought into Canada must be reported. It is important to note that severe penalties may be imposed for failing to comply with legislation governing the entry of people and goods into Canada. For more information, contact:

Port Administration Division
(Customs)
Revenue Canada
OTTAWA, Ontario
K1A 0L5
Canada

Telephone: (613) 954-7543
FAX: (613) 998-5584

A complete listing of the items to be imported, along with their value, description and serial numbers, if any, is required. A brief statement should be given on the purpose of the trip, the method of transportation, and intended itinerary, including the points and dates of entry and departure from Canada. Once this information has been received, you will be advised of any other requirements.

Communications and Transportation Requirements

Radio Act and General Radio Regulations

The licensee and radio operator are subject to the provisions of the *Radio Act (Canada)* and its regulations. In accordance with Section 3 of the Act, a licence is required to operate a radio station in Canada.

At least one member of your group should hold a professional class radio operator certificate if point-to-point communication is required between Canada and another country. As well, Canada's Department of Communications should be provided with a letter of concurrence from the country involved.

If you plan to communicate with Canadian government departments such as Energy, Mines and Resources Canada, the Department of Indian Affairs and Northern Development, the Royal Canadian Mounted Police or with private Canadian companies/associations such as the Canadian Petroleum Association, Bradley Air Services, or Hunters and Trappers Associations of the Northwest Territories on their assigned radio frequencies, you must obtain prior permission.

The Communications Department of the federal government requires at least 90-days notice to assess your communications requirements so that technical evaluation can be completed and necessary authorization for radio sets can be issued.

Completed radio licence applications and supporting documentation should be directed to:

Manager
Frequency Management and
Licensing Division
Telecommunications Regulatory
Service
Department of Communications
P.O. Box 2800
YELLOWKNIFE, N.W.T.
X1A 2I9
Canada

Transportation

Marine

Ice and water conditions may severely impede the progress of ships and boats navigating Arctic waters. Opportunities for resupply and fuel are limited. Before finalizing your plans, Coast Guard Northern should be contacted for permission to proceed with a voyage. You should contact:

Staff Officer to the Director
General
Coast Guard Northern
Transport Canada
344 Slater Street
OTTAWA, Ontario
K1A 0N7
Canada

Telephone: (613) 990-4872
FAX: (613) 997-4500

Air

Current information on air navigation, airport facilities and operational procedures is available from:

Airports Group
Transport Canada
Canada Place
1100-9700 Jasper Avenue
EDMONTON, Alberta
T5J 4E6
Canada

Telephone: (403) 495-3831
FAX: (403) 495-4748

also,

Canada Map Office
Energy, Mines and Resources
Canada
615 Booth Street
OTTAWA, Ontario
K1A 0E9
Canada

Further information about these facilities and pertinent laws and regulations may be obtained from either:

Director General
Public Affairs
Transport Canada
OTTAWA, Ontario
K1A 0N5
Canada

or

Director
Arctic Airports Division
Department of Transportation
Government of the Northwest
Territories
YELLOWKNIFE, N.W.T.
X1A 2L9
Canada

Telephone: (403) 873-7725
FAX: (403) 873-0297

FACILITIES IN THE ARCTIC

Restricted Sites and Facilities

There are areas where visitors are not welcome. These sites should not be approached except in emergency situations. Restricted sites are the following:

North Warning System (NWS), Distant Early Warning (DEW), and Department of National Defence (DND).

There are eleven North Warning System (NWS) radar sites operated for the Department of National Defence from the Yukon/Alaska border to Labrador. They have limited ability to provide support to groups not directly related to the operation and maintenance of the NWS sites.

No food, fuel, equipment or accommodation at NWS sites should be expected unless prior arrangements have been made. In addition to these eleven sites are other facilities which are remotely monitored and completely unattended; these have no support facilities for visitors.

There are many old DEW line sites that have been abandoned or are about to be abandoned. Some are in states of disarray and are unsafe. Except for emergencies, you are advised to stay clear of these sites.

If you are considering using any bases or stations operated by the Department of National Defence, make sure that you are granted permission before finalizing your travel plans. The following should be contacted:

For NWS and DEW sites:

Director
North Warning System Office
Department of National
Defence
101 Colonel By Drive
OTTAWA, Ontario
K1A 0K2
Canada

Telephone: (613) 996-0892
FAX: (613) 996-4366

For DND bases and stations:

Director
Continental Policy
Department of National
Defence
101 Colonel By Drive
OTTAWA, Ontario
K1A 0K2
Canada

and

Commander
Northern Region Headquarters
Department of National
Defence
P.O. Box 6666
YELLOWKNIFE, N.W.T.
X1A 2R3
Canada

Commander
Department of National
Defence
R.R. #1, Site 18
Comp. 47
WHITEHORSE, Yukon
Y1A 4Z6
Canada

Telephone: (403) 667-2559

High Arctic Weather Stations (HAWS)

The Atmospheric Environment Service of Environment Canada operates weather stations at two remote points; at Eureka on Ellesmere Island and at Mould Bay on Prince Patrick Island. The associated airdromes are established solely to support HAWS. Consequently, requests for meals and/or accommodation in these facilities require approval at least six weeks in advance. Write to:

Regional Director General
Atmospheric Environment
Service
Environment Canada
10th Floor
266 Graham Avenue
WINNIPEG, Manitoba
R3C 3V4
Canada

Attn: Senior Advisor, Polar Affairs

Telephone: (204) 983-4933
FAX: (204) 983-1687

It must be noted that NWS/DEW Line sites, DND bases and High Arctic Weather Stations cannot be expected to serve as sources of fuel, supplies, accommodation or other services.

Polar Continental Shelf Project

The Polar Continental Shelf Project (PCSP), a division of Energy, Mines and Resources Canada, provides logistics support to pre-approved science research programs conducted in the Canadian Arctic. PCSP operates from two main bases at Resolute in the eastern Arctic, and Tuktoyaktuk in the western Arctic. These facilities and services are restricted to government and university research groups. For further information, contact:

Director
Polar Continental Shelf Project
Energy, Mines and Resources
Canada
6th Floor, 344 Wellington Street
OTTAWA, Ontario
K1A 0E4
Canada

Necessary Provisions Required for Your Expedition

Food

All expeditions must be entirely self-sufficient. It is unlawful to hunt game for food, including dog food, without possession of a hunting licence, and unless accompanied by a licenced guide. Failure to plan your food requirements adequately is not considered justification to hunt under the *Northwest Territories Wildlife Act*. However, fish may be caught if a fishing permit has been obtained.

Any consideration of importing foodstuffs into Canada to provision an expedition should be checked carefully with Canadian authorities. Details may be obtained by writing to:

Port Administration Division
Customs and Excise
Revenue Canada
OTTAWA, Ontario
K1A 0L5
Canada

Caches

While in the Arctic, you may come across caches of food, fuel and equipment. Although some may appear to have been in place for several years, none has been abandoned. All are private or government property. Some caches were established by federal and territorial governments for emergency use. Others have been put aside by scientific or exploratory parties to sustain their operations over a number of years. You may also find caches of seal or caribou carcasses or other game stored by Inuit hunters.

None of these caches are intended for use by other people under normal circumstances. Only in a real emergency, when a party is threatened by hardship or death, may these stores be used. In such an extremity, remove and use only the food or fuel which you actually need. The traditional code of the North requires that those who use caches in an emergency will replace what was taken. Remember that unauthorized or unreported use of caches not only constitutes theft, but could well cause delay, additional expense, hardship or even death to those relying on them for their livelihood.

National Parks

Expeditions whose itinerary includes travel within or near one of Canada's National Parks in the Yukon Territory or the Northwest Territories should pay special attention to the following:

1. All parks have a mandatory registration program and provide visitor orientation and information as an aid to public safety and resource protection.
2. There are specific regulations and, in some cases, permits are required regarding wildlife, fishing, firearms, waste management, park access, food and fuel.
3. Depending on the activities planned, there may be a requirement for bonding and insurance concerning cost recovery of search and rescue activities, evacuation of personnel, and waste management on behalf of the Government of Canada.

If you plan to travel to an eastern Arctic or high Arctic National Park, contact:

Superintendent
Eastern Arctic District
Canadian Parks Service
P.O. Box 353
PANGNIRTUNG, N.W.T.
X0A 0R0
Canada

Telephone: (819) 473-8829
FAX: (819) 473-8612

If you plan to travel in the western Northwest Territories or the Yukon Territory, contact:

The Superintendent
Western District Office
Canadian Parks Service
P.O. Box 1840
INUVIK, N.W.T.
X0E 0T0
Canada

Telephone: (403) 979-3248
FAX: (403) 979-4491

Territorial Land Use Regulations

These regulations are designed to ensure that the sensitive Arctic environment is kept clean and that ecological damage does not occur. A permit is required if your expedition will remain in any one location for more than 100 person days (e.g. five people for 20 days = 100 person days) or establishes a fuel cache of more than 400 litres. Information and permits may be obtained from:

Regional Manager
Land Resources
Department of Indian Affairs
and Northern Development
P.O. Box 1500
YELLOWKNIFE, N.W.T.
X1A 2R3
Canada

Arctic Waters Pollution Prevention Act

This legislation prohibits the deposit of waste that could adversely affect Arctic marine waters in any area north of 60° latitude. Further information may be obtained from:

Director General
Natural Resources Economic
Development
Department of Indian Affairs
and Northern Development
OTTAWA, Ontario
K1A 0H4
Canada

or

Manager
Land Resources
Department of Indian Affairs
and Northern Development
200 Range Road
WHITEHORSE, Yukon
Y1A 3V1
Canada

WILDLIFE AND FISH

Northwest Territories Wildlife Act

The Wildlife Act of the Northwest Territories governs all activities related to wildlife. Licences are required to hunt game, and in the case of big game, guides must be hired by non-residents of the Northwest Territories. Permits are required to export furs or game. Licences and permits are available in most communities. Specific information may be obtained from:

For the Northwest Territories:

Director
Conservation Education/
Resource Development Division
Department of Renewable
Resources
Government of the
Northwest Territories
P.O. Box 1320
YELLOWKNIFE, N.W.T.
X1A 2L9
Canada

For the Yukon Territory:

Department of Renewable
Resources
Fish and Wildlife Branch
Government of the Yukon
P.O. Box 2703
WHITEHORSE, Yukon
Y1A 2C6
Canada

Telephone: (403) 667-5221
FAX: (403) 667-2691

***Migratory Birds Convention Act/
Canada Wildlife Act***

Permits are required to hunt birds or to remove birds eggs from their original source anywhere in Canada. Several Migratory Bird Sanctuaries and national wildlife areas have been established in Canada's North and Arctic. Access to and activities within these areas are regulated under permits issued by the Canadian Wildlife Service of Environment Canada. For information about the locations of Migratory Bird Sanctuaries and national wildlife areas, or to apply for an entry permit, or for general information about these areas, contact:

For the Northwest Territories:

Enforcement Coordinator
Canadian Wildlife Service
P.O. Box 637
YELLOWKNIFE, N.W.T.
X1A 2N5
Canada

Telephone: (403) 920-8551
FAX: (403) 873-8185

For the Yukon Territory:

Habitat Biologist
Canadian Wildlife Service
Environment Canada
P.O. Box 6010
WHITEHORSE, Yukon
Y1A 5L7
Canada

Telephone: (403) 668-2285
FAX: (403) 667-7962

Enforcement Coordinator
Canadian Wildlife Service
2392 Ospika Boulevard
PRINCE GEORGE, British Columbia
V2N 3N5
Canada

Telephone: (604) 561-5525
FAX: (604) 561-5534

The locations of wildlife sanctuaries are shown on maps of the Northwest Territories and the Yukon Territory. Maps can be obtained by writing to:

Canada Map Office
Energy, Mines and Resources
Canada
OTTAWA, Ontario
K1A 0E9
Canada

Game Export Act

A permit is needed to transport game across any territorial or provincial boundary in Canada. In this context, "game" includes whole animals or any part, but excludes finished or processed goods such as carvings, clothing or jewellery. You can obtain a permit from some detachments of the Royal Canadian Mounted Police, or from any office of the Department of Renewable Resources, Government of the Northwest Territories.

CITES Export and Import Permits

The import, export or re-export of certain species is regulated under the *Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES)*.

Should you plan to import or export from Canada any specimen or artifact derived from a wild animal or plant, you should ensure that it can be transported legally into or out of the country. For example, most marine mammals, their parts or derivatives may not be exported without CITES permits. For further information contact:

Administrator (CITES)
Canadian Wildlife Service
OTTAWA, Ontario
K1A 0H3
Canada

Telephone: (819) 953-1411
FAX: (819) 953-6283

For specific information pertaining to marine mammals contact:

Section Manager
Dept. of Fisheries and Oceans
501 University Crescent
WINNIPEG, Manitoba
R3T 2N6
Canada

Telephone: (204) 983-5160
FAX: (204) 984-2402

Fisheries Act and Regulations

The Fisheries Act and its regulations governs all activities related to fish and marine mammals in Canadian waters. This includes commercial, subsistence and sports fishing, and the protection of fish and fish habitats from disturbance, destruction or harassment.

Permits are required to conduct research on fish or to collect specimens, including live captures. For information contact:

Director General
Western Region
Department of Fisheries
and Oceans
501 University Crescent
WINNIPEG, Manitoba
R3T 2N6
Canada

Telephone: (204) 983-5117
FAX: (204) 984-2401

Points of contact for parties in the field are Officers of the Department of Fisheries and Oceans located in Iqaluit, Inuvik, Rankin Inlet, Yellowknife or any office of the Department of Renewable Resources, Government of the Northwest Territories or write to:

Manager, Western Arctic Area
Department of Fisheries
and Oceans
Box 1871
INUVIK, N.W.T.
X0E 0T0
Canada

Telephone: (403) 979-3314
FAX: (403) 979-4330

Manager, South/Central Arctic Area
Department of Fisheries
and Oceans
P.O. Box 2310
YELLOWKNIFE, N.W.T.
X1A 2P7
Canada

Telephone: (403) 920-6640
FAX: (403) 873-8871

Manager, Eastern Arctic Area
Department of Fisheries
and Oceans
Box 358
IQALUIT, N.W.T.
X0A 0H0
Canada

Telephone: (819) 979-6274
FAX: (819) 979-4539

Officer in Charge
Department of Fisheries
and Oceans
Box 1008
HAY RIVER, N.W.T.
X0E 0R0
Canada

Telephone: (403) 874-2331
FAX: (403) 874-6922

Officer in Charge
Department of Fisheries
and Oceans
Box 158
RANKIN INLET, N.W.T.
X0C 0G0
Canada

Telephone: (819) 645-2871
FAX: (819) 645-2880

District Supervisor
Department of Fisheries
and Oceans
122 Industrial Road
WHITEHORSE, Yukon
Y1A 2T9
Canada

Telephone: (403) 667-2235
FAX: (403) 668-6829

Archaeological and Historical Resources

Many official activities are carried out to preserve and catalogue the archaeology and history of northern and Arctic Canada. Archaeological and historical sites and artifacts are protected by law in the Northwest Territories. If you come upon an archaeological or historical site, do not disturb or deface it in any manner. Under no circumstances are artifacts to be removed. If you find an artifact, do not touch or remove it unless it is in danger of being destroyed. In practice, there is very rarely sufficient justification for the unauthorized removal of an artifact. If possible, photograph it and report it to:

For the Northwest Territories:

Director
Prince of Wales Northern
Heritage Centre
Government of the Northwest
Territories
YELLOWKNIFE, N.W.T.
X1A 2L9
Canada

For the Yukon Territory:

Director
Heritage Branch
Department of Tourism
Government of the Yukon
P.O. Box 2703
WHITEHORSE, Yukon
Y1A 2C6
Canada

Telephone: (403) 667-5386
FAX: (403) 667-2634

Scientific Research Activities

Under the *Northwest Territories Scientists' Act*, all scientific research must be licensed. If you are planning to conduct research involving northern or Arctic residents, you must obtain prior approval from the community council involved to ensure that your research is acceptable to local residents. You are expected to keep the community aware of progress in your research and to report results within a reasonable time after completion. The

confidentiality of personal data must be respected and you have a moral obligation to terminate any study that is potentially harmful to people or to the environment. Please address all correspondence regarding Scientific Research Licences to:

Science Administrator
Science Institute of the
Northwest Territories
P.O. Box 1617
YELLOWKNIFE, N.W.T.
X1A 2P2

Telephone: (403) 873-7592
FAX: (403) 873-0227

Research studies on land animals (any species of terrestrial vertebrates including polar bears but excluding migratory birds) require a licence under the *Wildlife Act*. Please apply to:

Director
Wildlife Management Division
Department of Renewable Resources
Government of the
Northwest Territories
YELLOWKNIFE, N.W.T.
X1A 2L9
Canada

Telephone: (403) 873-7411
FAX: (403) 873-0293

If you are planning to research a subject in the Yukon Territory, certain permits and licences are required under *The Scientists' and Explorers Act*. Further information may be obtained by writing to:

Director
Heritage Branch
Department of Tourism
Government of the Yukon
P.O. Box 2703
WHITEHORSE, Yukon
Y1A 2C6
Canada

Telephone: (403) 667-5386
FAX: (403) 667-2634

PART II

A PHYSIOLOGICAL DESCRIPTION OF THE NORTH AND ARCTIC REGIONS OF CANADA

Climate

The main features of the climate of northern Canada and the Arctic are low temperatures and precipitation, short cool summers and long cold winters.

Average annual temperatures are lower than in any other part of Canada, ranging from -6°C at Baffin Island in the extreme southeast to -20°C in northern Ellesmere Island. But record low temperatures of -45°C to -50°C have been reported at most stations in the Arctic.

During the cool summer, the largely ice-covered seas with surface temperatures near -1°C prevent the air from warming appreciably. Consequently, summer temperatures are cool throughout the entire region, averaging 1°C to 8°C during July, the warmest month. Summer weather is often marked by light rain and overcast skies.

In winter, most water surfaces are frozen, but conduction of heat from the water below the ice exerts a moderating influence. February is normally the coldest month, with average temperatures generally ranging from -33°C to -38°C in the high Arctic.

Northern winters pass in near darkness. In the high Arctic the polar night begins in late October and ends in early February, a period of slightly more than three months. During winter, the sky is cloudless and the sun

During winter, the sky is cloudless and the sun does not appear. However, the nights are seldom really dark because of the glitter of stars and moonlight.

The sun never sets from early May to mid-August. This creates twenty-four hour days. Snow may fall in any month of the year, but the ground begins to clear in late June. Although some snowbanks persist through the summer, new snow does not begin to accumulate until August. The fine and powdery snow of the North is readily blown about by the wind, with the result that much of the ground is bare throughout the winter. Accumulated snow, up to 6 metres deep, may form in the lee of obstacles.

The chilling effects of wind are considerable. The term, "wind-chill" is often used to indicate the relative severity, or human discomfort, of the combination of wind and low temperature. January on Prince Patrick Island has a mean wind-chill of 2250 watts per square metre, which corresponds to a temperature of -40°C and a wind speed of 15 kilometres per hour. This is extremely cold; unprotected skin will freeze in one minute in direct exposure.

Ecological Sites

Ecological sites are unique areas worthy of special protection. These areas support a variety of plant and animal communities and may contain relic or endangered populations, unique plant associations, breeding areas and critical ranges for animals, pristine lakes, mineral springs, and marine areas. Visitors are required to obtain prior permission to visit these areas because of the stress that their presence can place

on life in the very short breeding season. These sites allow the study of natural ecosystems or of the recovery of ecosystems from natural and human disturbances. Some of the northern ecological sites and their specialities are listed below:

- Bailey Point on Melville Island has the highest muskox densities in the Canadian Arctic;
- Seymour Island northwest of Bathurst Island, has the only breeding colony of the rare ivory gull in the Canadian Arctic and is a migratory bird sanctuary;
- Polar Bear Pass on Bathurst Island is a National Wildlife Area under the *Canada Wildlife Act*. It provides an important habitat for 42 species of birds and 8 species of mammals;
- Hobhouse Inlet on Devon Island is the home of 75,000 to 100,000 breeding pairs of northern fulmars - possibly the largest known colony;
- Cape Sparbo on Devon Island features lowlands with exceptionally luxuriant vegetation, 150 to 200 muskoxen, and lakes containing Arctic char;
- The Truelove Lowland, part of the Cape Sparbo site, has been the base for many geological studies;
- Coburg Island, at the eastern entrance to Jones Sound, features 200,000 breeding pairs of thick-billed murres, walrus, belugas and narwhals;
- Tanquary Fiord on Ellesmere Island has a diverse flora due to its remarkably warm summers;
- Fosheim Peninsula on Ellesmere Island,

described as one of the richest biological sites in the high Arctic, supports thousands of arctic hares often found in large herds; and

- Phillips Inlet at the top of Ellesmere Island is noted for its glaciers, including the Ward Hunt Shelf which is the source of large ice islands found in the Arctic Ocean and among the Queen Elizabeth Islands.

Permafrost

One of the characteristics of northern areas of Canada is the ground condition known as permafrost. Permafrost is a term used to describe ground that remains below 0°C for at least one year. This definition also applies to frozen sands or gravels and to solid rock.

Permafrost thickness in the Canadian Arctic is believed to range from 300 metres at Cambridge Bay, Victoria Island, to possibly 600 metres at Resolute and on the north coast of Ellesmere Island. Permafrost thickness of 1000 metres or more may exist at high elevations in the interior of Baffin and Ellesmere Islands. The thickest recorded permafrost in Canada, about 560 metres, was found at Winter Harbour on Melville Island.

Plant Life

In many respects, the high Arctic is a desert. But like other deserts, it is an ecologically sensitive region that responds very slowly to damage caused by humans. Vast areas are covered by rock-strewn barren flats which in summer appear devoid of vegetation. As in other desert regions, there are relatively lush oases. These are generally confined to coastal lowlands and valleys and can

sustain an almost continuous cover of sedge and moss as well as flowering plants. This vegetation is important for certain wildlife species.

Most plants found in the high Arctic seldom grow beyond 10 centimetres in height. Sedges and grasses, the "giant" plants of the islands, rarely reach a height of more than 25 centimetres, even in the best sites.

Land Mammals

Of the approximately 200 species of mammals in Canada, only 17 occur in the Arctic. On land, the list includes two large grazers (caribou and muskoxen), three carnivores (wolf, arctic fox, and ermine), and two rodents (the collared lemming and the arctic hare).

Marine Mammals

Ten species of mammals live in, or depend upon, the icy waters of the Arctic. Of these, whales - bowhead, narwhal, and white - live entirely within the ocean. Carnivorous seals, including the walrus and the ringed, bearded, harp, harbour, and hooded seals, are only slightly less reliant on the marine environment. These animals obtain all their food from the sea but occasionally must move onto land, or landfast ice, to moult and mate. Finally, there is the polar bear, a true marine mammal, which spends most of its life wandering the pack ice in search of seals. All these animals carry a thick layer of fat or blubber under their skin to insulate them from the frigid Arctic waters.

Polar bears often show little fear of people; indeed, they may wilfully approach people out of hunger, aggressiveness, or curiosity. The result may be a fatal mauling, extensive damage to property, or destruction of the

bear. It is important that expeditions and wilderness travellers protect themselves against polar bears by maintaining clean camps and by thoroughly incinerating all garbage and refuse.

Do not feed bears and do not be a brave photographer. If chased, throw off your parka or pack to distract the bear. In short, when in the Arctic, expect to meet bears, as you would expect cold weather and storms, and plan accordingly.

Fish

Arctic char are the most important fish species of the Canadian North. However, other fish such as polar cod, sculpins, and capelin form vital links in the marine food chain.

Birds

The wind-scarred landscape and seascape of the Arctic sustain an unusual but varied assortment of birds, including unfamiliar species like the ivory gull or thick-billed murre. The more widely known types, such as snow geese and tundra swans are also present. Of the 640 species of birds that live in Canada and the United States, only 65 species spend their summers in the high Arctic. Fewer than six, including the common raven, rock ptarmigan, and the swift gyrfalcon, overwinter in the North.

The chief avian predators of this region are the snowy owl, the gyrfalcon, and the peregrine falcon. Snowy owls feed mostly on lemmings and other small- or medium-sized mammals, including arctic hares. The two falcons, which prey mostly on birds, are said to be the fastest fliers alive, reaching speeds of 320 kilometres per hour when diving on prey. Disturbance of nesting birds especially those breeding colonially (geese, seabirds), should be avoided at all times. Do not bring dogs near nesting birds.

SEAS AND SEA ICE

Permanent polar ice, which covers the North Pole and extends from the Canadian Arctic Archipelago to the seas off northern Siberia, has been described as the most significant surface area of the globe, for it controls the temperature of much of the northern hemisphere. The southern limit of the permanent polar ice lies just northwest of the Queen Elizabeth Islands.

Freeze-up comes by early October, when landfast ice, or "fast ice", has formed along the shorelines of the islands. In midwinter, it extends many kilometres off the coast or, in narrow channels, it reaches from shore to shore. Pack ice covers the larger channels, extending between the zones of fast ice attached to island shorelines.

Breakup occurs in late spring or early summer when snow melts on the sea ice. When melted snow seeps through cracks in the ice, it leaves dry hummocks of white ice separated by ponds and streams of water.

The degree of summer breakup varies considerably. Channels between the northern Queen Elizabeth Islands are choked with ice year-round. Lancaster Sound and eastern Barrow Strait may become mainly open water relatively early, but M'Clure Strait has never been known to become mainly open water.

Ice Features - Pressure Ridges

Pressure ridges develop when ice floes collide, causing the sheet to buckle, forcing up walls of broken ice. They can also develop when tides or currents cause fast ice to heave, crack, and buckle. Ridges are surprisingly solid soon after they form as a melting and refreezing process welds the blocks of ice together.

Pressure ridges, as high as 20 metres, have been reported off northern Ellesmere Island. They can be very difficult to cross, even for experienced travellers.

Ice Features - Leads and Polynyas

Leads and polynyas are areas of open water, anomalies in an ice-filled sea. Leads, which are normally long and linear, generally develop between the fast ice and the pack ice as a result of tides, winds and currents. They usually form late in winter or in spring and are most numerous before breakup. Polynyas are generally smaller, non-linear areas that appear in narrow channels where currents are strong. Some polynyas remain open throughout the winter, although most are formed before breakup in late spring.

Leads and polynyas tend to recur in the same area. The famous "North Water", which recurs every year in the northern extremities of Baffin Bay, is actually an exceptionally large polynya. In mid-winter it occupies an area of thousands of square kilometres.

Ice Features - Icebergs and Ice Islands

Icebergs are large floating masses of ice that have broken off glaciers and drifted out to sea. In the Queen Elizabeth Islands, icebergs are calved off glaciers on Ellesmere, Axel Heiberg, and Devon islands. Large icebergs can reach the size of a football field.

Ice islands in the Arctic Ocean are large individual pieces of fresh water ice. These huge, floating plates of ice can measure 700 square kilometres or more in area and can attain a thickness of 10 to 60 metres.

Ice Features - Pack Ice

Pack ice, also known by such terms as ice fields, ice floes, ice cakes or pan ice, are formed at sea. Ice fields are the largest aggregation of pack ice that can extend hundreds of square kilometres. They are made up of thousands of haphazard shaped ice chunks.

PEOPLE AND TEMPERATURES

A key challenge faced by northern newcomers involves learning how to cope with the extreme cold. The cold not only can make working in the Arctic extremely uncomfortable, it can also, in various situations, threaten survival.

Working in the cold is more comfortable if clothing is kept clean and dry. Both wetness and dirt drastically reduce the insulating properties of clothing. The cold can quickly turn dirty or wet clothes into a set of frozen armour.

Dry comfortable work in the Arctic is also assisted by good ventilation of clothes. Hard work causes perspiration which will freeze inside your clothing, decreasing effective insulation and increasing incidence of freezing. When working in a parka, drop the hood and allow the warm air around your body to escape.

The insulating quality of clothing depends largely on the existence of dead air spaces between garment surfaces as well as the air spaces within the clothing fabric. The layers of air are an effective insulation against the cold in combination with the insulation value of separate layers. Norwegian fishnet undergarments are based on this principle; their open mesh construction traps air next to the body for maximum warmth.

In extreme cold, the body works harder to provide the energy necessary to maintain a constant temperature. Consequently, it is essential to eat properly and regularly. Increasing the intake of high calorie foods, particularly fats, is a common strategy. So is the practice of carrying chocolate bars or candy as sources of quick energy.

In the Arctic, it is important to stay protected from the wind. Temperatures as low as -45°C are not unpleasant if there is no wind, but temperatures of -30°C with a 30-kilometre-per-hour wind are much harder to take because the wind draws heat away from the body. Whenever possible, work should proceed behind wind screens or breaks of some type.

Arctic workers, like seafarers, must be constantly aware of the threats and hazards of fire. If a fire gets started, there may be no place to go except into the cold until help arrives - if it arrives. Fires should always be treated with utmost respect.

In emergency Arctic situations, the first task involves getting warm and protected. Cold hands are efficiently warmed when placed against the belly or genitals, while frostbite is best handled through slow warming. Simple shelters can be made by digging into the side of a snowdrift. Slabs of snow can be used to close off the opening. Attempts to create elaborate structures such as igloos should be avoided because they are often unsuccessful and can deplete vital energy.

When it is necessary to seek shelter at sea, avoid towering icebergs in open water. They are always dangerous as the area below the surface melts faster than that above, causing them to topple over. Low-topped icebergs offer safer shelter. In emergency shelters, build a small fire with a reflector to direct the heat. Even a candle

flame in a small enclosure can keep a person from freezing. Carbon monoxide poisoning will be prevented by providing good ventilation in shelters where fires are burning.

If you are lost, do not rely on a compass for direction unless you are an expert at navigating in high latitudes. The magnetic north pole is in the Arctic Islands and its location is constantly changing.

In emergencies, there are several ways of telling direction other than by compass. Snow drifts point in the direction of the prevailing winds which, in most parts of the Arctic, are out of the north, usually north-west or north-east. The sun can also help to determine orientation.

The time of day multiplied by 15 gives a rough bearing of the sun. For example, if it is 2:00 p.m., or 1400 hours, the sun will be at 15 times 14, or 210°. At night, the easiest method is to use the pole star, which is almost directly in line with the two stars on the outer edge of the Big Dipper. Simply face the pole star and you are facing true north.

On sea ice, direction may be difficult to determine because the pack ice is constantly moved by winds and currents. Landmarks such as high pressure ridges and hummocks are usable only for short distances, since they may be located on other floes and are constantly changing location. The need for repeated checks on the sun and stars is obvious.

In attempting to attract attention, make signals that are large or highly conspicuous. Fires, flares, or mirror flashes are effective in signalling aircraft. The characters 'X' and 'SOS' often show up well when stamped into the snow in letters no less than 2 metres wide and 20 metres high.

No matter how well sheltered or prepared you may be, you require water to survive more than a few days. If you cannot find open water, melt ice for water rather than snow; you get more water for the volume with less heat and time. At sea, the experienced Arctic traveller uses last year's or older ice for cooking and drinking; it is less salty. Last year's ice can be distinguished from this year's by the rounded corners which are due to the thaws of summer. It looks bluish in comparison with salty ice which is grey and milky in appearance.

Although emergency situations are rare, when they do occur they can be disastrous. The best strategy involves in-depth preparation. When travelling, it is important to be prepared for the possibility of trouble. And if difficulties occur, it is important to maintain a positive attitude.

Frost-bite

Frost-bite refers to the freezing of living tissue. Nose, cheeks, ears, and the chin are usually the first parts of the body to be affected. Frost-bite may also affect the tips of fingers if gloves are worn instead of mitts, or feet if boots are laced too tightly.

The modern treatment for frost-bite is simply a slow warming of the frozen areas at room temperature. Once the frost-bite has been cleared up there will be skin damage, which may result in infection. Use a bandage with sulpha powder, boracic acid, or vaseline to prevent further complications once the initial danger is over.

Hypothermia

Hypothermia describes the rapid, progressive mental and physical collapse accompanying the chilling of vital internal organs of the human body. Caused by exposure to cold, it is aggravated by dampness, wind and exhaustion. Symptoms include uncontrollable fits of shivering, slurred speech and frequent stumbling. Without treatment, it may lead to stupor, collapse and even death.

Treatment is accomplished by returning the body temperature to its normal range. The best method is a hot bath and drying with a rough towel. In emergencies, the patient should be taken to a shelter and bedded down. If heating units are unavailable, strip the patient of clothing, cover with blankets, and keep the patient warm with the body heat of others. Efforts to revive a frozen person should continue for several hours.

Snow Blindness

In the Arctic, especially in late winter and spring, there is danger of severe irritation to the eyes from the sun's rays; rays can either be direct or reflected by snow, ice, or water. Light of unusually high intensity, with higher-than-normal percentages of ultra-violet rays are characteristic of northern sunlight. The only protection is to wear snow goggles. In a pinch, eye snow shields may be improvised from wood, cloth or even thick strong paper such as a dollar bill.

Treat snow blindness by protecting the eyes from light and relieving the pain. Protect the eyes by staying in a dark shelter or by wearing a light-proof bandage. Relieve pain by putting cold compresses on the eyes and by taking aspirin. Most cases recover within 18 hours without medical treatment.

Carbon Monoxide Poisoning

A gas resulting from incomplete combustion of fuels, carbon monoxide is very dangerous and can cause death. The first signs of carbon monoxide poisoning are usually dizziness, headache, nausea, and drowsiness. If breathing has stopped apply artificial respiration and expose the patient to fresh air.

Litter

Disposal of litter and garbage is an inevitable problem at field camps and larger facilities throughout the Arctic. Too often we have seen pictures of rusting gas barrels, windblown plastic and paper and abandoned heavy equipment scarring the northern landscape. Litter continues to be an eyesore for many years after the camp itself is gone. This is particularly true in the Arctic where natural decomposition is very slow.

An increased sensitivity toward the problem of litter is backed by laws and regulations that govern disposal and provide penalties for those who dump waste. Daily incineration of all waste food is essential to discourage polar bears, foxes and wolves from gathering around camps. In general, the regulations state that whatever is taken into camps should be taken out again, except for those items that are permitted to be buried or incinerated.

CONCLUSION

You are now armed with the information you need to plan your expedition or journey into northern and Arctic Canada. Addresses have been provided for you should you require further information on a given area. The physiological information has been provided as an adjunct to the more practical aspects of planning an expedition.

This information is set in the context that you should be fully aware that once you arrive in northern or Arctic Canada, you will be left to your own devices. There are few, if any, roads, shops, or people to help you on your way. All expeditions and self-guided wilderness trips must be self-sufficient in everything from toothpicks to air transportation to first aid.

The North and Arctic can be merciless to ill-prepared travellers. Be cautious, be wise and do not be afraid to ask for advice in planning your journey. It could save your life.

CANADA'S NORTHERN REGION

6.85 Million Square Kilometres

RÉGION NORDIQUE DU CANADA

6.85 millions de kilomètres carrés



EQUIVALENT AREA IN EUROPE

SURFACE COMPARABLE EN EUROPE

